Notice of Allowability	Application No.	Applicant(s)	
	10/669,101	LEVENSON, RICHARD	
	Examiner	Art Unit	
	I Kenneth Kholdebarin	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Phone interview on September 25, 2007*.

2. ☒ The allowed claim(s) is/are *1,5-7,9,11-23,26-28, 31-33,35,41-43,48-53*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Continuation of Attachment(s) 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 09/23/2003,02/19/04, 08/18/05, 07/30/2007.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Marc Wefers, Reg. No. 56,842 on September 25, 2007.

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended): A method comprising:

illuminating a sample to cause the sample to emit radiation, wherein the sample is a living mammal ~~comprises~~ comprising deep tissue supporting a target compound, ~~and~~ wherein the emitted radiation comprises emission from the target compound and emission from one or more other components in the sample, wherein the emission from the other components of the sample comprises autofluorescence from one or more layers of tissue in the sample different from a layer of tissue comprising the deep tissue, and wherein the deep tissue is subdermal tissue;

spectrally filtering the emitted radiation with each of ~~a plurality of~~ at least four different spectral weighting functions;

storing an image of the spectrally filtered radiation for each of the spectral weighting functions; and

processing the stored images to construct a deep tissue image of the sample in which signal from the other compounds is reduced relative to signal from the target compound, wherein

processing the stored images comprises constructing the deep tissue image based on a weighted superposition of information in the stored images and at least one emission spectrum for the other components in the sample.

2. Canceled.

3. Canceled.

4. Canceled.

5. (Currently Amended):: The method of claim [[3]] 1, wherein the animal comprises a mouse~~, a zebrafish,~~ or a human.

6. (Currently Amended): The method of claim [[2]] 1, wherein the deep tissue is an internal organ of the living ~~organism~~ mammal.

7. (Currently Amended): The method of claim [[2]] 1, wherein the deep tissue lies within about 2 mm or more of the living ~~organism~~ mammal.

8. Canceled.

9. (Original): The method of claim 1, wherein the emission from the other components of the sample comprises autofluorescence from tissue overlying the deep tissue.

10. Canceled.

11. (Original): The method of claim 1, wherein the target compound is a fluorescent probe bound to at least a portion of the deep tissue.

12. (Original): The method of claim 1, wherein the target compound is a quantum dot bound to at least a portion of the deep tissue.

13. (Original): The method of claim 1, wherein the target compound is a green fluorescent protein (GFP) bound to at least a portion of the deep tissue.

14. (Original): The method of claim 1, wherein the target compound is a yellow fluorescent protein (YFP) bound to at least a portion of the deep tissue.

15. (Original): The method of claim 1, wherein the target compound is a red fluorescent protein (RFP) bound to at least a portion of the deep tissue.

16. (Original): The method of claim 1, wherein the emission from the target compound is fluorescence.

17. (Original): The method of claim 1, wherein at least some of the spectral weighting functions correspond to particular wavelength bands.

18. (Original): The method of claim 17, wherein all of the spectral weighting functions correspond to particular wavelength bands.

19. (Original): The method of claim 1, wherein at least some of the spectral weighting functions correspond to sinusoidal weightings of multiple wavelength bands.

20. (Original): The method of claim 1, wherein the spectral filtering comprises using a liquid-crystal, tunable optical filter.

21. (Original): The method of claim 1, wherein the spectral filtering comprises using an interferometric optical filter.

22. (Original): The method of claim 1, wherein the spectral filtering comprises using a filter wheel containing a plurality of band pass filters.

23. (Original): The method of claim 1, wherein each stored image comprises an intensity value for each of multiple pixels.

24. Canceled.

25. Canceled.

26. (Currently Amended): The method of claim [[25]] 1, wherein constructing the deep tissue image comprises calculating a remainder spectrum for one or more pixels in the set of stored images.

27. (Currently Amended): The method of claim [[25]] 1, wherein processing the stored images comprises constructing the deep tissue image based on the stored images, the at least one emission spectrum for the other components in the sample, and an emission spectrum for the target compound.

28. (Original): The method of claim 27, wherein constructing the deep tissue image comprises solving at least one component of a matrix equation in which one matrix is based on the stored images, and another matrix is based on the emission spectra.

29. Canceled.

30. Canceled.

31. (Original): The method of claim 1, wherein the deep tissue supports multiple target compounds and processing the stored images comprises constructing a deep tissue image for each of the target compounds.

32. (Previously Presented): The method of claim 31, wherein processing the stored images comprises constructing the deep tissue images based on the stored images and emission spectra for the target compounds.

33. (Previously Presented): The method of claim 32, wherein processing the stored images comprises constructing the deep tissue images based on the stored images, the emission spectra for the target compounds, and at least one emission spectrum for the other components in the sample.

34. Canceled.

35. (Currently Amended): A method comprising:

providing ~~a plurality of~~ at least four images of spectrally filtered radiation emitted from a sample that is a living mammal in response to an illumination,

wherein the sample comprises deep tissue supporting a target compound,

wherein the emitted radiation comprises emission from the target compound and emission from one or more other components in the sample, ~~and~~

wherein the emission from the other components of the sample comprises autofluorescence from one or more layers of tissue in the sample different from a layer of tissue comprising the deep tissue,

wherein the deep tissue is subdermal tissue, and

wherein each image corresponds to a different spectral weighting function; and

processing the images of the spectrally filtered radiation to construct a deep tissue image of the sample in which signal from the other compounds is reduced relative to signal from the target compound, and wherein processing the images comprises constructing the deep tissue image based on a weighted superposition of information in the stored images and at least one emission spectrum for the other components in the sample.

36-40. Canceled.

41. (Previously Presented): The method of claim 1, wherein the emission comprises emission from a thickness of tissue at least 2 mm thick.

42. (Previously Presented): The method of claim 35, wherein the emission from the other components of the sample comprises autofluorescence from tissue overlying the deep tissue.

43. (Previously Presented): The method of claim 35, wherein the emission comprises emission from a thickness of tissue at least 2 mm thick.

44-47. Canceled.

48. (New): The method of claim 35, wherein at least some of the spectral weighting functions correspond to particular wavelength bands.

49. (New): The method of claim 48, wherein all of the spectral weighting functions correspond to particular wavelength bands.

50. (New): The method of claim 35, wherein at least some of the spectral weighting functions correspond to sinusoidal weightings of multiple wavelength bands.

51. (New): The method of claim 35, wherein constructing the deep tissue image comprises calculating a remainder spectrum for one or more pixels in the set of stored images.

52. (New): The method of claim 35, wherein processing the stored images comprises constructing the deep tissue image based on the stored images, the at least one emission spectrum for the other components in the sample, and an emission spectrum for the target compound.

53. (New): The method of claim 52, wherein constructing the deep tissue image comprises solving at least one component of a matrix equation in which one matrix is based on the stored images, and another matrix is based on the emission spectra.

2. The following is an examiner's statement of reasons for allowance: The prior art of the record teaches the autofluorescence from the layer of tissue but dose not teaches autofluorescence from one or more layers of tissue in the sample different from a layer of tissue comprising the deep tissue, and wherein the deep tissue is subdermal tissue;
And also spectrally filtering the emitted radiation with each of at least four different spectral weighting functions

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CONCLUSION

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to I Kenneth Kholdebarin whose telephone number is 571-270-1347. The examiner can normally be reached on M-F 8 AM- 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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09/25/2007

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